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REPLACEMENT PAGES 4 and 4/1, 5, 8, 9 and 9/1

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Title: PLASMA DISPLAY PANEL MANUFACTURING
METHOD FOR ACHIEVING LUMINESCENCE
CHARACTERISTICS

Attorney's
Docket No.: NAK1-BN30a

EXPRESS MAIL LABEL NO. EL 873069916 US

DATE OF DEPOSIT: August 21, 2001

One reason for this is the deterioration in the phosphors used. The compound $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}$ used as a blue phosphor is particularly prone to deterioration during the aging process, resulting in a decrease in luminous intensity and a deterioration in luminescent chromaticity.

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DISCLOSURE OF THE INVENTION

In view of the above problems, the object of the present invention is to provide a PDP that may undergo the necessary aging process with minimal phosphor deterioration, and that
10 has a comparatively high luminous efficiency as well as high-quality color reproduction.

In order to achieve the above object, a PDP manufacturing process is performed in the following way. First, a front plate and a back plate, on at least one of which discharge
15 electrodes have been arranged and on at least one of whose inner surfaces a phosphor layer has been formed are sealed together so that an inner space is formed between them. Then an aging process in which a required discharge voltage is applied to the discharge electrodes is performed. The aging
20 process includes an introducing process in which a discharge gas with a partial steam pressure of 15 Torr or less is newly introduced into the inner space from the outside and an evacuating process, in which discharge gas is evacuated from the inner space. By performing the introducing process
25 together with the evacuating process, discharge gas can be circulated continuously or intermittently through the inner

space, while a required discharge voltage is applied to the discharge electrodes, thereby enabling discharge to be produced.

Furthermore, a PDP manufacturing process may be performed in the following way. First, a front plate and a back plate, on at least one of which discharge electrodes have been arranged and on at least one of whose inner surfaces a phosphor layer has been formed are sealed together so that an inner space is formed between them. Then an aging process in which a required discharge voltage is applied to the discharge electrodes is performed. The aging process includes an introducing process in which a discharge gas with a partial steam pressure of 15 Torr or less is newly introduced into the inner space from the outside and an evacuating process, in which discharge gas is evacuated from the inner space. The discharge generated when a required discharge voltage is applied to the discharge electrodes is divided into a plurality of discharge periods. By performing the introducing and evacuating processes in the intervals between discharge periods, discharge gas can be circulated through the inner space.

Here, the introducing process introduces gas via a first air vent formed in the panel, and the evacuating process evacuates gas via a second air vent formed in the

panel.

Consequently, the PDP subject to the aging process has the following structure. A plurality of discharge spaces are formed by arranging a plurality of partitions to divide up the inner space between the front plate and the back plate, and a sealing glass layer for sealing the panel is included between the perimeters of the front plate and the back plate. Then a first space connected to the discharge spaces formed by the plurality of partitions is formed between first ends of the plurality of partitions and the sealing glass layer, and a second space connected to the discharge spaces is formed between second ends of the plurality of partitions and the sealing glass layer.

among the plurality of partitions and one part of the barrier are connected to prevent discharge gas from flowing into space between the outermost partitions and the barrier.

5 The PDP subject to the aging process further includes a structure in which the first air vent is formed in the vicinity of one of the outermost partitions, and the second air vent is formed in the vicinity of the other outermost partition, on the opposite side to the first air vent.

10 In this kind of structure discharge gas mainly flows through a plurality of gas passages leading from the first space to the second space. This prevents deterioration in the phosphors during the aging process.

15 The partial pressure of steam contained in the discharge gas introduced into the inner space should preferably be 10 Torr or less, 5 Torr or less, 1 Torr or less or even 0.1 Torr or less.

An inert gas may be used as the discharge gas introduced into the inner space. Helium, neon, argon or xenon may be used as this gas.

In order to achieve the above object, a PDP manufacturing process is further performed in the following way. First, a front plate and a back plate, on at least one of which discharge electrodes have been arranged and on at least one of whose inner surfaces a phosphor layer has been formed are sealed together so that an inner space is formed between them. Then a heating process for heating phosphors in the phosphor layer is performed after the aging process has been completed. This heating process enables the characteristics of the phosphors to be restored.

The heating process following the aging process should preferably heat the phosphors to as high a temperature as possible, specifically of 300°C or more. If possible, the phosphors should be heated to an even higher temperature, such as 370°C or more, 400°C or more or even 500°C or more.

The phosphors may be heated by heating the whole panel in an oven at a specified temperature, by concentrating a laser beam on the part of the panel on which the phosphors are arranged or by circulating a heating medium through the inner space. If the whole panel is heated using an oven, the panel cannot be heated at a temperature higher than the softening point of the glass used to seal the front and back plates of the panel together. If the more localized methods of a laser beam or heating medium are used to heat the panel, however, it can be heated to a higher temperature.

The heating process following the aging process (if heating in an oven or using a laser) should preferably be performed

while the gas in the inner space is being evacuated.

The heating process following the aging process (if heating